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Growth and structural change in Africa: development strategies for the learning economy

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This paper discusses opportunities and policy options for African countries seeking innovation and learning based development strategies. What kind of policies and institutions are necessary in order to transform the current increase in rents from commodities exports into industrial investment and upgrading of agriculture and agro-industrial development? This question is raised in the context of competing theories about economic development. On the basis of empirical patterns and theoretical considerations we discuss policy options in relation to the African reality.

Keywords: development strategy; learning economy; policy; structural change

Introduction

Recent press reports suggest that Africa may now be at a turning point in terms of economic growth and development. These reports point out that, although starting from a low base, Africa is now the world's fastest growing continent (The Economist 2013). However, naïve optimism on this ground should be avoided (Karuri-Sebina et al. 2012). The recent growth has been concentrated in particular countries and sectors and the transformation of growth into sustainable social and economic progress will not happen automatically.

There is thus a discrepancy between the reporting of record growth rates for African economies in the media and the reality of how people's living conditions have evolved over the last decade in the African high growth economies. The widely shared understanding among development scholars that registered economic growth and development must be seen as two distinct, even if related, processes has become more evident than ever. In this paper we will argue that in order to transform the economic upswing as measured by gross domestic product, fast-growing African countries need structural and institutional change across the economic, social and political spheres that bring them closer to what we will refer to as 'learning economies'.

The widening of the gap between reality on the ground and perceptions based on growth rates reflects partly that the increasing global demand for natural resources – especially for commodities such as oil and minerals – has led to advantageous change in terms of trade and to increased export volumes and raised the rates of GNP growth while the impact upon domestic employment has often been limited and sometimes negative. The expansion of the commodity sector does not automatically create large-scale employment directly and so far it has rarely resulted in a substantial increase in job creation in upstream and downstream manufacturing and in knowledge based services.

It has even been argued, that the structural change that occurred in low income economies with high rates of growth had a negative impact upon the potential for future aggregate economic growth (McMillan and Rodrik, 2011). They have pointed to the fact that the share of low productive workplaces, many of them in informal sector activities or in subsistence agriculture, has grown in the midst of the period of rapid growth. This has gone hand in hand with de-industrialisation – the share of the labour force in manufacturing has fallen from an already low level.

We will take this as starting point for an analysis of opportunities and policy options for African countries seeking innovation and learning based development strategies (Muchie 2003). What kind of policies and institutions are necessary in order to transform the current increase in rents from commodities exports into industrial investment and upgrading of agriculture and agro-industrial development?

This question is raised in the context of competing theories about economic development. We contrast the recommendations of neoclassical economists with those that can be derived from the classical development economics that includes scholars such as Dobb, Hirschman and Sen. The theoretical perspective that we propose on this basis takes into account that we have entered a phase – the learning economy – where it is useful to take as starting point that 'learning' is at the core of any process of development. Development is a process where individuals and organisations learn to do new things and learn to do them in new ways in conjunction with structural transformation. At the core of the process of development is competence building. In the paper we analyse development and learning at the micro, macro and meso-level.

On the basis of empirical patterns and theoretical considerations we will discuss policy options in relation to the African reality. This is not easy. First, there are major differences between African countries – there is not one strategy that fits all. Second, in many African countries the most fundamental barriers for development are socio-political rather than techno-economic. Here political transformations must go hand in hand with socio-economic and technological transformations. Finally, as outsiders to the African scene we can refer to lessons from other parts of the world and sketch dilemmas and alternative options, but the relevance of these lessons needs to be assessed on a case-by-case basis and the specific strategies need to be built on the basis of local experience.

Recent developments in Africa's economies

Growth and structural change

In a recent contribution, Valensisi and Davis (2011) analyse recent patterns of growth and structural change in the least developed economies, including most of the south of Sahara countries. They refer to the rapid growth between 2000 and 2009 – on average GNP has grown by 7% per annum. They show that even average GDP per capita increased by as much as 5.5% (growth was unevenly distributed so median growth for this group of countries was 2.2%). The authors make an effort to go behind this observed pattern of growth in order to understand the underlying structural change process.

They find that the impressive growth record was based upon rapid growth in the exports of hard commodities and on a capital inflow (FDI, ODA and remittances inflow) that allowed for a strong growth in consumer demand for services and for imported consumer goods. Agriculture grew only slowly and in most of the least developed economies there was deindustrialisation (in two thirds of the least developed economies the share of manufacturing was reduced from its already modest level).

The growth process and the increased demand for natural resource-based commodities did not lead to any increase in the investment ratio – on average the rate of investment remained close to 20%. Most of the extra income was absorbed by middle-class consumption and in many African countries (38 out of 49) imports grew more than exports. One problem with this pattern of growth is that it does not create sufficient number of decent jobs for the many young people in Africa. Another problem is that it establishes a vulnerable economic structure where the whole economy is dependent on single hard commodity export products.

Insufficient job creation and poverty reduction

The UN 2013 Economic report on Africa recognises the problems with the current lopsided growth pattern – it is presented under the heading 'Making the Most of Africa's Commodities: Industrializing for Growth, Jobs and Economic Transformation'. It points out that the employment problem remains unsolved in most African countries.

> Strong growth across the continent has not been translated into the broad-based economic and social development needed to lift millions of Africans out of poverty and reduce the wide inequalities seen in most countries. This is because Africa's recent growth, driven by primary commodities, has low employment intensity – that is, the ability to generate jobs (ECA and AUC, 2010).
>
> Thus the continent continues to suffer from high unemployment, particularly for youth and female populations, with too few opportunities to absorb new labour market entrants …
>
> More than 70 per cent of Africans earn their living from vulnerable employment as economies continue to depend heavily on production and export of primary commodities. Investments remain concentrated in capital-intensive extractive industries, with few forward and backward linkages with the rest of the economy (United Nations 2013, 30).

The report also points out that the impact of growth on poverty reduction has been modest:

> Recent data show some slight improvement in poverty reduction, even though the region will not be able to achieve the related MDGs. The proportion of people living in extreme poverty (below $1.25 a day) in Africa (excluding North Africa) has been projected to reach 35.8 per cent in 2015 against the previous forecasts of 38 per cent (UN, 2011). This slight, albeit slow, improvement is partly attributable to high and sustained economic growth since 2000 (United Nations 2013, 35).

The general picture is that the growth in global demand for natural resource based commodities – especially hard commodities such as minerals – has driven growth in the high growth economies in Africa. Combined with an inflow of financial resources this has stimulated private consumption of domestic services and imported manufactured goods. The employment impact and the impact in terms of poverty reduction have been very limited. A third problem is that the kind of structural change that has taken place with de-industrialisation, growth in urban informal employment and stagnating productivity in agriculture may undermine the prospects of future economic development.

Growth-reducing structural change

McMillan and Rodrik (2011) pursue a simple exercise where they break down the observed aggregate growth in labour productivity into two components for the period 1990–2005. One component reflects productivity growth within sectors and the second component is the effect that comes from moving labour from sectors with low to sectors with high levels of productivity. According to the authors, African countries have been characterised by a trend-wise move of labour from high to low productivity sectors (including urban informal sectors). This is what the authors refer to as growth-reducing structural change.

This observation goes against what should be expected since productivity gaps between sectors are extremely

big in the least developed countries. Therefore we would expect that economic development takes the form of workers moving from low to high productivity sectors. But actually the opposite takes place in most of the observed countries. Exceptions are Ghana and Ethiopia, where structural change made a positive contribution to economic growth. According to McMillan and Rodrik, to change the dominant negative direction there is a need to direct investment to manufacturing and especially to expand manufacturing activities with more value added to the products. According to the authors, flexible labour markets should help. Below we will propose more ambitious policies related to building learning economies as a response.

National technological capabilities in Africa

Mayor et al. (2012) have made an attempt to map the distribution of technological capabilities in Africa. The analysis covers 30 African countries for the years 2010–2011 and the data used emanate from World Economic Forum, either from statistical sources or from an executive survey. Technological capabilities are presented in three dimensions: (a) The available base (internet use, educated labour and R&D). (b) Government and business technological effort (technological infrastructure, enterprise performance and policies related to innovation). (c) Results (patents and IPR-regime).

The analysis leads the authors to define four clusters of countries where South Africa stands alone as lead country followed by Morocco, Tunisia and Egypt. The countries with the weakest technological capacities are Algeria, Libya, Mauretania and Zimbabwe. It should be taken into account that most of the data emanate from surveys with business leaders and that there might be a bias in favour of regimes that do not intervene with regulating business activities.

Nonetheless, the analysis illustrates that Africa is heterogeneous and that different countries face different challenges when it comes to develop and make use of technological capabilities. It is also worth noting that almost all of the lead countries have experienced political turmoil recently. We are going to turn back to this later since it indicates that investments in upgrading the skills of the young generation that are not followed by economic opportunities may lead to discontent and unrest.

What is development?

A neoclassical theory of development

If we start from neo-classical economics and deduce how less developed countries may catch up, the focus of policy intervention would be on institutional design aiming at well-defined private property rights, including intellectual property rights. It would certainly recommend ubiquitous introduction of the market mechanism, it would propagate private ownership and recommend keeping the public sector as small as possible. It would advise against protectionism and tampering with international trade and capital flows. The role of government should be limited to secure a stable macroeconomic context and to guarantee private property, including intellectual property.

In cases of *obvious* market failure, government may be allowed to intervene. For instance, scientific information may be seen as a public good and therefore require state production or subsidy. But generally governments should stay out of the economic process and leave it to the market to give signals to actors. Specifically, there would be a strong emphasis upon the advantages of free trade. Through the free working of comparative advantages, resources would be used in the most efficient way. Since all countries have equal access to information, including technology, we would expect a general tendency toward convergence in productivity and living standards. This 'neoclassical theory of development' lies behind what has been called the Washington Consensus.

Recent history demonstrates that most of the countries that have built their strategy on the assumptions of neoclassical theory have failed to develop and that most of those that have prospered, especially those in Asia, have deviated from these ideas. Going further back in history it is obvious that the rich countries did not become rich by following the neoclassical prescriptions. They protected their industries and they showed little respect for intellectual property rights. Actually it was almost a rule that countries emulated technologies developed in other countries often with such success that they became technology leaders. But the theory and the prescriptions remain very much alive since they are strongly supported by powerful global interest groups and institutions rooted in the developed countries.

The book by Stiglitz, Lin and Patel (2013) on industrial policy in Africa offers a modified version of the neo-classical development theory that uses the frequency of market failure and not least the importance of knowledge and learning as arguments for a more selective and interventionist industrial policy. Actually, it argues that neo-classical economics has accepted that industrial policy is now not only acceptable but also commendable. It may be noted that the authors say nothing about infant industries and trade and that there is a tendency to recommend moderate interventions with full respect for 'comparative advantage'.

Development economics

In the late 1940s there was a growing interest to try to explain and remedy economic underdevelopment. One of the first important contributions that triggered the debate was Rosenstein Rodan (1946). The basic question was: How could the poor countries catch up with rich countries? The debate was quite polarised. Some of the literature came from Marxists who saw global inequality as rooted in an imperialist system and assumed that the only way for poor countries to grow rich was a transformation

toward a socialist and centrally planned economy. Others belonging to the liberal camp took the opposite view and saw underdevelopment as reflecting that markets were not free and that capitalist institutions were not sufficiently well established.

A group of scholars with mixed ideological background – Arthur Lewis, Rosenstein Rodan, Lewis, Singer, Maurice Dobb, Amartya Sen, Albert Hirschman and others – came with more complex prescriptions for how poor countries could grow rich. They proposed that five elements were absolutely essential for development:

1. A high rate of savings and investments
2. A first stage of import substitution increasingly to be combined with expansion of exports
3. Absorbing technological knowledge from abroad
4. Focus upon expanding the manufacturing sector
5. An active role for the state in guiding the direction of development.

It is interesting to note that in the countries that were the most successful and competitive entrants in the world economy, Japan, Korea and China, all the five elements were present. But it is also true that in other parts of the world the attempts to combine import substitution with learning from abroad were much less successful in developing self-propelling industrial growth – at least in the long term. The less successful examples were often countries in Latin America and Africa with higher degrees of inequality and with political systems that invested less in building the domestic knowledge base necessary to learn from abroad.

So one cannot say that the theory was ever proven to be wrong. Rather, the experience indicated that while the five conditions listed might be necessary they were not sufficient. In the meantime international organisations such as the World Bank, IMF and OECD dominated by the USA set conditions for loans and assistance that made realising the conditions very difficult to those developing countries that became (made themselves) dependent on loans and grants.

Aggregate growth and structural change

Macroeconomists sometimes assume that economic growth takes place as in a corn economy with only one sector. They do so in order to keep things simple and make advanced mathematical modelling possible. This perspective misses out the very fundamental fact that growth and structural change are two sides of the same coin (Pasinetti 1980). Aggregate growth will reflect the uneven growth rates in different sectors in the economy – and in national accounts the growth of the whole is actually a weighted sum of the growth of its parts.

In this context Kutsnetz (1966) makes a very elementary but often neglected point. He shows that high rates of aggregate growth typically require that the big sectors grow rapidly. Even if a new sector grows very rapidly its contribution to aggregate growth will, to begin with, be modest. Therefore accelerating growth in the currently dominating sectors – such as agriculture or the urban informal service sector in Africa – is an obvious way to raise income per capita in the short to medium term. A typical pattern of growth for the rich countries has been to raise productivity in agriculture while workers have moved from agriculture to manufacturing. In Africa, raising the productivity in the informal sector and to create demand for labour outside the informal sector is a major challenge.

This is important since the informal sector remains a significant and even expanding economic force in sub-Saharan Africa. The sector is estimated to account for more than 65 percent of non-farm employment in sub-Saharan Africa (Adams et al. 2013). In Tanzania the informal sector is estimated to account for more than 55% of employment in urban areas and over the 2001–2006 period the number of workers in the informal sector increased at an annual rate of 9% as compared to 4% for the economy as a whole (Kahyarara and Rutasitara, 2009). It is obvious that a successful industrialisation strategy would reduce the relative weight of the informal sector in the long term. Given its current weight in the sub-Saharan economies, measures to upgrade workers' skills and the technologies used in the informal sector would give substantial contributions to growth and welfare. The same is of course true for agriculture, which is the other major sector in terms of employment in most of the least developed economies.

But it is equally true that in the long term the emergence and growth of new sectors is crucial for the wealth of the nation. The ideal new sectors would be characterised by rapid technological learning, increasing returns to scale and increasing world demand. And it must to some degree build upon already existing domestic competence in the labour force and in enterprises. It may be a problem to foster such new sectors when traditional big sectors have strong representation in the political system – cf. soy producers in Argentina and the oil industry in the Northern Africa. Finding ways to align the interests of dominating sectors with the formation of new sectors may be necessary to overcome such barriers.

One of the most fundamental questions now debated among innovation scholars is what role natural resources-based sectors and especially those producing hard commodities such as minerals, oil and gas can play in a process of industrial transformation. Is it correct that such sectors offer less potential for technological learning and for building upstream and downstream couplings as well as lateral transfer of knowledge to other sectors? Or does this version of the 'resource curse' view just represent left-overs from the classical development economists? Do new perspectives on how local firms can link up to global value chains make these views obsolete? Another relevant question is if it is possible to create sufficient volume of new jobs for the young generation without

industrialisation. We return to these questions in the last sections of the paper.

Learning, innovation and development

Stiglitz (2011) proposes that there is a need to engage in 'Rethinking development economics'. It is remarkable that he builds his argument around the concept 'the learning society' – a concept that has been central among innovation scholars for many years. Brændgaard et al. (1992) presented ideas for innovation policy in the learning society in the context of the analysis of national systems of innovation (Lundvall 1992). Two years later Lundvall and Johnson (1994) developed further this concept under the heading 'the learning economy'. As pointed out in Lundvall et al. (2009), several scholars such as Viotti (2003) have proposed to refer to national learning systems in developing countries rather than to present them as national innovation systems. In this section we will present a perspective on development that is rooted in our interpretation of the concept 'the learning economy'.

An ambitious definition of development must refer not only to registered economic growth and structural change. We should also take into account the welfare of individuals and how resources and capacities are distributed among individuals, regions and classes. It also needs to take into account long-term generational perspectives. Such a definition would take into account both material conditions and mental and spiritual conditions, including positive and negative experiences from being a member of traditional and new communities. It would need to reflect experiences from different roles in life such as the roles of consumer, family member, citizen and worker. Short-term gains should be weighed against long-term costs and foregone opportunities – such as environmental degradation and depletion of non-reproducible natural resources.

Here we are going to be more modest and bring in two dimensions that tend to be neglected in the traditional view on development and economic growth. The first refers to *the quality of working life* while the second refers to the crucial role of the uneven capacity to learn and the *uneven access to learning*. The most primitive versions of welfare economics assume that increasing the bundle of consumption goods is basically what constitutes increased welfare. This is why national income per capita is the most frequently used indicator. The perspective is implicit in the argument in favour of free trade combined with 'flexible' work arrangements.

For instance, while the positive impact of globalisation on consumption opportunities is taken into account, possible negative consequences upon job security and working conditions are neglected. This traditional perspective is especially problematic when it comes to assessing economic development in Africa, where increasing consumption opportunities for the middle class seems have gone hand-in-hand with more vulnerable employment and less quality in working life for the majority of workers.

In order to understand the importance of learning, it is useful to start from Amartya Sen's definition of welfare as 'freedoms' and capabilities to realise what you regard as valuable. This is, in general, a valuable approach because it takes into account that the aspirations of people may be different in different countries and regions. We would nonetheless, in this context, like to emphasise 'access to learning' as perhaps the most fundamental freedom – especially in a society characterised by rapid change in people's private and professional lives. The two concepts learning and development are crucially interconnected, both at the individual level and at other levels of the economy – learning organisations, learning regions and the learning economy at the aggregate level. There are two reasons why we should focus upon learning.

First, a crucial prerequisite for any kind of economic transformation is a speed-up of learning as competence building, both among individuals and within organisations. Structural change is a process where people are confronted with new tasks. Second, we would argue that learning is not only of instrumental value, enhancing the productivity of the individual worker. It is also of substantive value for individuals. This is obvious for the child's development into adulthood. To block the child's process of learning to communicate and act in society would be cruel. For most adults a life without any learning would constitute monotony.

This perspective does not rule out that the speed of learning imposed by circumstances may become disturbingly high and create stress and suffering, especially when the individuals have no capabilities to understand and manage the processes involved. Neither does it mean that all forms of learning represent progress. And learning new things implies that old knowledge becomes obsolete. Learning as well as development will *always* involve creative *destruction*. As new patterns take form, old ones tend to be destroyed. Often the old patterns are seen as positive by some of those living in the society. In worst cases, destruction takes place without much creation. While some form of creative destruction is necessary to lift African people out of poverty, the involvement of ordinary citizens in the management of change would make the processes of change and learning less painful.

Stiglitz (2011) argues that there is another kind of link from a learning economy perspective to inclusive development. His argument is the correct observation that the learning society will be most successful when learning is broad based and knowledge is widely spread in the economy. In a series of papers on the learning economy we have presented a somewhat different perspective where we have showed that, if left to itself, the learning economy tends to become increasingly polarised (Lundvall 1996, Lundvall 2002). Only with strong and systematic government intervention aiming at strengthening the capacity of

weak learners and offering them better access to learning is it possible to build strong learning societies.

Transformation pressure, learning capacity and redistribution

In a context of global competition, national economies as well as firms are exposed to a more or less intense 'transformation pressure'. For instance, the strong competition from China has put a very intense transformation pressure on manufacturing firms in Africa. The transformation pressure at the level of the manufacturing firm can be reduced in different ways. For instance, workers may accept lower wages, the currency may be devalued or government may introduce trade barriers to protect the domestic firms in order to promote import substitution. An alternative is that the firms are left to themselves to cope with the intensification of the transformation pressure. They might do so by downscaling or bankruptcy. Alternatively they may respond by engaging in organisational and technological learning, resulting in a stronger competitiveness based upon higher productivity and incremental product and process innovations.

When the transformation pressure is growing, it speeds up structural change in the national innovation system. Low productivity activities will be closed down. With a sufficient population of firms with a capacity to innovate and adapt, the resources that are freed up from the firms closing down will be absorbed by these new or growing high productivity activities. But with a weak learning capacity at the level of firms, the result will be further increase in underemployment in informal activities and unemployment. How the costs and benefits of the transformation are distributed affects how willing people will be to contribute actively to the process of transformation within the firms. The response at the national level will reflect the strength of the national innovation and competence building system.

Why we need to broaden the innovation system concept

One major difference between neoclassical economics and evolutionary economics is that in the evolutionary perspective, history and institutions matter (Nelson 1993). The national system of innovation (NSI) concept signals that the economic structure and the current institutional setup, both with historical roots, need to be analysed and understood in order to set policy priorities. However, it is obvious that different authors mean different things when referring to a national system of innovation. Some major differences have to do with the focus of the analysis and with how broad the definition is in relation to institutions and markets.

Authors from the USA with a background in studying science and technology policy tend to focus the analysis on 'the innovation system in the narrow sense'. They tend to regard the NSI-concept as a follow-up and broadening of earlier analyses of national science systems and national technology policies (see for instance the definition given in Mowery and Oxley 1995, 80). The focus is upon the systemic relationships between R&D efforts in firms, science and technology (S&T) organisations including universities, and public policy.

Freeman (1987) developed a broader concept that took into account national specificities in how firms organise innovative activities – he emphasised, for example, how Japanese firms increasingly used 'the factory as laboratory'. Researchers at Aalborg (Lundvall 1985; Andersen and Lundvall 1988) also developed a concept of innovation systems where there are other major sources of innovation than science. Innovation is seen as reflecting interactive learning taking place in connection with on-going activities in production and sales. Therefore the analysis takes its starting point in the process of production and the process of product development, assuming, for instance, that the interaction with users is fundamental for product innovation.

None of these approaches, however, gave sufficient attention to the broader set of institutions shaping competence building in the economy, such as labour markets, the education and training system, and their relation to systems of corporate governance. Nor did they consider the broader connections between these institutional subsystems and national political cultures and welfare regimes. In order to capture this wider set of interactions in a dynamic perspective, we introduce an evolutionary framework for analysing how economies learn under the pressure of globalisation.

Mediating transformation pressure

The starting premise is that a range of factors have resulted in an acceleration of economic change. These factors include economic globalisation, policies and demands of international institutions such as deregulation of finance, population growth, technological change, etc. In many African countries the boom in commodities exports adds to these factors. When the *transformation pressure* becomes more intense it means that firms will have to engage in change in terms of organisation, technology and capability if they want to survive and grow. At the level of the labour market, this process will be reflected in dynamics where workers will gain, lose or change jobs while learning new (and forgetting old) skills and competences.

A crucial characteristic of a national system is how it responds to an increase in transformative pressure. The *capability to innovate and to adapt* will reflect systemic features having to do with how easy it is to establish interactive learning within and across organisational borders (social capital) and with the preparedness to take risks (entrepreneurship). Organisational capabilities and the competence structure of the workforce play an important role. Social cohesion may be an important

factor behind social capital while it might get in the way of entrepreneurship.

The mechanism for *redistribution of costs and benefits emanating from change* differs between national systems. Figure 1 below is adapted from the framework developed in Archibugi and Lundvall (2000) to link transformation pressure to the capacity to innovate and to the distribution of cost and benefits of change.

The view developed in the book is that capabilities to innovate and to adapt reflect systematic differences in national institutional arrangements at the levels of the science and technology system, labour markets, education and training, and finance. These institutional subsystems will impact on how knowledge is developed and used within organisations and these organisational differences in turn will have a bearing on innovation pace (fast or slow) and innovation style (incremental or radical).

But national differences in innovation systems need to be seen in an even broader perspective and take into account feedbacks from the distribution of costs and benefits to the capacity to innovate and to adapt. An uneven distribution may create a negative attitude to change among those who mainly register the costs and if there are high degrees of insecurity among individuals they will tend to oppose change.

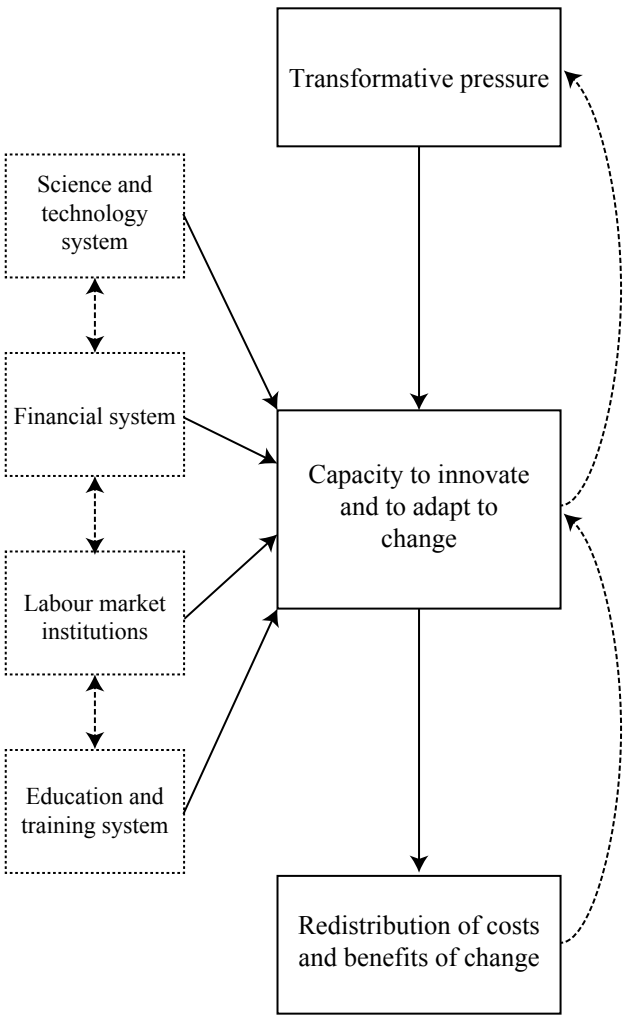

Figure 1: A model linking transformation pressure to the capacity to change and to the distribution of the costs and benefits of change

A second kind of feedback mechanism goes from the ability to innovate to transformation pressure. Increasing the ability to innovate involves stimulation of entrepreneurship and the building of more flexible organisations. This implies a selection of people and institutions that are more change oriented and this further increases transformation pressure.

Development strategies responding to transformation pressures

The simple model presented above can be used to distinguish between different developmental strategies. The Washington Consensus based upon neoclassical assumptions recommends that governments leave it to the market to determine the transformation pressure and to install a capacity to adapt through flexible labour markets. Redistribution of costs and benefits of change should be kept at a minimum in order not to get prices and incentives wrong.

The development economists (Singer, Dobb and Sen) saw a need for less developed economies to regulate the transformation pressure shielding new industries from the full impact of international competition. It is interesting to note that they as well as the fathers of the concept of 'infant industry argument' (Hamilton and List) saw strengthening of the knowledge base of the economy as another necessary prerequisite for economic development.

Friedrich List thus insisted that 'mental capital' was more important for development than physical or financial capital. The emphasis upon intangible capital, knowledge and technology has become even more clear in recent theories of economic development pointing to 'capabilities' and innovation systems as crucial for economic development. In the next section we will go deeper into how knowledge and learning links to economic development.

As we remarked above, the Asian countries were more successful in using the protective strategy than countries in Latin America and Africa, where the result was stagnation rather than economic growth. One explanation is that there was too little emphasis upon building innovation capacity, that the protection from competition from abroad was not compensated by other mechanisms stimulating competition and that income and access to land were more inequally distributed in Africa and Latin America.

Macro conditions for development

The general macroeconomic situation will affect the capacity of firms to engage in investment and innovation. This is one of the points where there is agreement among those belonging to the Washington Consensus camp and

those in favour of selective industrial policies promoting innovation. But there are differences in terms of focus. Washington Consensus recommendations only propose financial discipline and stable prices. This perspective neglects that innovation is to some degree demand-driven and that engaging in entrepreneurial activities is much less risky in a situation when aggregate demand is growing. Also the neoliberals propose to leave it to the market to regulate finance, something that results both in more instability and in very limited access to loans especially for small and medium enterprises.

Investment and finance

One of the most fundamental weaknesses of national innovation systems is the financial system. In most of the least developed countries, access to capital for supporting ordinary trade, for investments in production capacity and especially for new innovative ventures is very limited. Banks do not have the routines or skills to deal with more risky projects and neither have government authorities.

Therefore the creation of new public-private institutions filling the function of development banks is crucial. This would require building new competence and here South–South learning could play an important role. Among the sources of finance to be channelled into the new institutions could be export levies on non-renewable hard commodities.

Educated labour

It is obvious that education is an important prerequisite for economic development. This can be seen from the historical record of developed economies and from the recent growth of Asian countries. Basic education offering literacy and basic mathematical skills may be seen as fundamental human rights since such skills are necessary for full participation in society. Secondary and tertiary levels are of course important for economic and social development.

A major problem is that the demand for candidates with higher education is very limited in the least developed countries. This leads to an exodus of highly educated people to the rich countries and in this way the scarce resources invested in universities end up not being used in the less developed countries. The 2012 UNCTAD report on the least developed countries has a theme the issues of brain drain and brain gain and also on how remittances from emigrants may be mobilised for development.

The report shows that the outflow of highly trained people from the least developed countries increased 1990–2000 and that it has kept growing in the new millennium. For many African countries the brain drain rate (the brain drain rate is the emigrants' share of the corresponding age and educational group in the home country) is over 40%. This is for instance true for Uganda, Rwanda, Somalia, Eritrea, Liberia, Sierra Leone and Gambia.

While the report discusses possible advantages of having a diaspora of trained people abroad, there is little doubt that the outflow of skilled people from the poorest to the richest countries (the USA remains the main destination) is unfair and undermines development efforts in the home countries.

The main reason for the exodus of skilled people is lack of job opportunities and very big differences in earnings between home country and host country. In a paper on higher education, innovation and economic development (Lundvall 2008), we showed that the lack of demand reflects absence of innovation and that therefore investments in higher education need to be coordinated with and supported by framework conditions and policies that stimulate innovation. The higher the rate of innovation is, the higher is the rate of return on investments in higher education.

It is also a serious problem that the education system replicates elements from the former colonial powers. Universities train people with a strong emphasis on social science and humanities, while there is a tendency to neglect the training of vocational skills and engineering. Emphasis is upon narrowly defined scientific disciplines and higher education institutions often operate as academies with very limited elements of practical training. Introducing problem-based learning and elements of practice in theoretical studies may reduce the problem of creating jobs for the candidates.

Public policy and institutional design

As pointed out in the introduction, there are strict limits for what external experts can offer when it comes to design and implement public policy schemes and when it comes to design new institutions that support economic development. In what follows we refer to what seems to work in other contexts and what we see as general principles for promoting development.

Non-discrimination as development strategy

Taking the learning economy perspective on economic development makes it clear that the inclusive formation of people skills and their interaction is crucial. In many of the least developed economies, including those in Africa there is discrimination to ethnic minorities and to women in terms of access to resources and citizen rights. A focus on reducing discrimination when it comes to learning – not only in terms of access to formal education – but also processes of learning in production and policy processes expands the access to human resources and creativity. In many societies the inclusion of women and ethnic minorities can offer new potential and more commitment to economic processes.

A specific problem in Africa is the age structure, with a strong overweight of young people. Developing new institutions that give young people a 'voice' in development issues may be a way to avoid that the youth get

alienated and engage in destructive activities individually or collectively, but may be a special challenge in countries where there is a tradition to listen most to the old and experienced.

Such changes may be crucial also for attracting the diaspora intellectuals who often find patriarchy and authoritarianism repelling.

Industrial and trade policy

In a recent document from UNCTAD, some general principles for economic development are referred to (UNCTAD 2012, 132):

> In recent years, UNCTAD has repeatedly argued that progressive transformation in economic structure is a prerequisite for LDCs to achieve accelerated and sustained economic growth and poverty reduction. The policies and strategies needed to attain structural transformation will involve, inter alia,
>
> (a) the development of a new industrial policy based on a strategic approach that reflects the speciic needs and conditions of LDCs;
>
> (b) a catalytic developmental State to compensate for the incipient and weak private sector in LDCs;
>
> (c) measures to encourage private investment in productive activities and public investment in basic infrastructure, including the development of skills and support institutions;
>
> (d) the promotion of domestic technological learning and innovation and improvements in productivity in both agricultural and manufacturing sectors.

Our analysis above supports those principles but they are somewhat general to be implemented as such and they need to take into account the specificities of African countries' specific recent development. The UN economic report for Africa 2013 moves in that direction by demonstrating the limits of the current development patterns where natural resource rents are not transformed into investment in manufacturing and agriculture.

The UN report points to the formation of 'industrial clusters' around commodity production on the basis of private-public partnerships as the central strategy. The advantage with such an incremental strategy is that it builds upon what is already there and aims at raising productivity in existing activities.

But there might be a need for more bold industrial policy strategies that take the wider perspective of the national innovation system and aim at fostering new manufacturing industries with high learning potential. Here productivity of the whole economy could be increased by moving resources from low to high productivity sectors.

Industrial policies as learning processes

It is useful to see public policy as a learning process. There is no reason to assume that policy makers get things right from the very beginning. For instance, we found that the original intentions of the Chinese reforms aiming at creating 'markets for knowledge' did not succeed (Lundvall and Gu 2010). The enterprises were not ready to procure knowledge from universities and other knowledge institutions. Instead, knowledge suppliers had to move ahead and establish their own enterprises in order to bring knowledge into use. This unintended process turned out to be an important step for China in its catch-up process and it was accepted as such by policy makers.

When policy makers in African countries take new initiatives in industrial policy they should be aware of the fact that it is a learning process. This involves systematically evaluating outcomes and not least registering unexpected outcomes – both positive and negative – and making sure that the next wave of initiatives take these experiences into account.

Stiglitz et al. (2013) discuss the argument that industrial policy should be avoided in Africa because there is too little administrative capacity to pursue industrial policy in Africa. They turn down the argument. But there is little doubt that there is much for African policy makers to learn from successful catching up economies. Programmes with expert exchange between African countries and some Asian countries could be one way to speed up policy learning.

Environmental policy as industrial policy

As the global climate change regime moves ahead towards 2020, there will be increasing investments related to climate change mitigation and adaptation in poor countries. Substantial opportunities for funding of low carbon innovations will arise, particularly in Africa. Ensuring that the most adequate technologies are selected and that they are diffused and used in such a way that the outcome is better living conditions for the population is a major challenge (Lema et al. 2014).

At the same time environmental policy is an important form of industrial policy with potential for job creation. Making it more costly to use carbon-based technologies and giving support to low carbon solutions will change not only the structure of power production but also the wider industry structure. Introducing low carbon solutions in agriculture and in the informal sector, for instance through new systems for recycling and repair activities, can offer both investment and job opportunities.

The BRICS connection and below the radar innovation

The most recent developments in Africa with growing dependence of production of commodities and a tendency toward deindustrialisation reflects the growing role of China and other emerging economies. It is major task for governments in Africa to exploit the potential for a positive interaction with BRICS countries. This potential reflects that emerging economies are in a particularly strong position to advance relevant and affordable technologies because conditions in BRICS are more similar to those in poor countries.

But even the most 'adequate' technologies developed abroad will need to go through a process of transformation in order to become both efficient and inclusive in the specific context of African countries. The fact that solutions may be adequate has little to do with the source of the technology but depends on the contextualisation and adaptation of the technology into the local context (Arocena and Sutz 2000). Building absorptive capacity in the informal sector and in agriculture requires new types of policy initiatives.

The global regime for knowledge protection and sharing

Above we could see how very scarce resources used for higher education went into investments in people who then moved to rich countries that could benefit from the investments. The lack of protection of these resources can be argued in terms of the need for individual freedom to move from one country to another. The argument is weakened when it turns out that the rich countries respect for this freedom is highly selective. Ordinary poor people with less education are effectively blocked at the frontiers of the rich countries.

The lack of protection of human capital stands in strong contrast to the global rules regarding intellectual property rights. The WTO agreements on TRIPS set very strict limits for the use of knowledge developed abroad and they have been even further restricted by bilateral agreements between the USA and least developed countries (Padmashgree and Roffe 2012). The WTO agreements also include references to the duty of developed countries to engage in technology transfer to the least developed economies but those references are vague, without monitoring and sanctions.

There is little doubt that the global regime for knowledge sharing and protection is biased in favour of the rich countries. To renegotiate this regime would require a coordinated effort of African countries, perhaps with a role for the African Union.

The natural resource curse and the need to promote of manufacturing in Africa – some reflections on the implications for public policy

The data and conclusions presented under the heading 'the resource curse' in Sachs and Warner (1995) have triggered a substantial amount of analytical work as well as heated debate among economists and political scientists. Recently the topic has attracted the attention of scholars linking innovation and innovation policy to development (see for instance Katz 2006; Perez 2010; Lizuka and Soete 2011; Lizuka and Katz 2011; Andersen 2012; Morris, Kaplan and Kaplinsky 2012: Dantas and Bell 2011; Maleki 2013).

Some early contributions to the resource curse debate by economic historians such as Gavin Wright and Paul David demonstrated that knowledge creation and learning in direct connection with the exploitation of mineral resources have been crucial for US economic growth. Others such as De Ferranti et al. (2002) have argued that the most important explanation of the different paths of development where Nordic countries succeeded in developing strong and diversified economies starting from a situation of natural resources specialisation, while Latin America failed to do so, had to do with a weak knowledge base and with an institutional setup that did not support processes of learning.

On this basis innovation scholars have argued against a specific version of the natural resource curse based upon assumptions that:

1. The learning potential and the knowledge content is limited in natural resources-based sectors.
2. Natural resources-based sectors tend to develop as enclaves with limited capacity to drive the creation of upstream and downstream manufacturing.

It is in line with the argument in this paper that the key difference between successful and less successful growth policies lies in the nature of the learning process that promotes the economic potential of access to natural resources (Wright 2001). A crucial issue is how natural resources-related activities make use of and master new technologies and knowledge to improve production processes (De Ferranti et al. 2002). A key question is how Africa can exploit the 'window of opportunity' opened up by increased global demand for natural resources and transform into a knowledge base that would allow for sustained and inclusive growth.

We share the skepticism as to the generalised resource curse hypothesis and see the building of clusters around natural resources as one useful step toward economic development in Africa. But we see a need to develop further the policy implications of the criticism. We are not convinced that the natural resource base should be *the only* starting point for industrialisation in Africa. The fact that most African countries import big proportions of their consumption goods from abroad indicates a potential for import substitution. Second, we see the broad-based growth of manufacturing as crucial for making Africa's economies less vulnerable and for creating jobs for the young generation. This is the case even if there is a great potential for learning and upgrading in natural resources-based sectors.

In relation to building clusters around natural resources – both mining and agriculture – we see a crucial need for building relevant capacity in *engineering and design*. Without local competence in these areas there is no possibility to link up with global value chains with unique and high value-added products. But the same is true for any attempt to build industrial capacity. One important reason why the attempts to realise import substitution in Latin America and Africa did not succeed is that technical training and engineering were given too little attention as compared to general education in science, social science and humanities.

Notes

1 This paper was drafted to form the basis for a presentation at the AfricaLics Academy held in Algiers in October, 2013. It also draws on a concept note prepared by the authors for the Globelics Seminar on Innovation and Economic Development, Dar-es-Salaam, March 2012.

2 An important factor is that, daily, thousands of young economics students are exposed to programmes teaching this message. Many of those working in ministries of finance in African countries have been trained to believe in it.

3 The fact that the landed aristocracy in England became involved in trade and industry was a major factor that made the industrial revolution possible.

4 This section draws on Lundvall (2005).

5 To a certain degree, these differences in focus reflect the national origin of the analysts. In small countries such as Denmark, as in developing countries – a major concern of Freeman – it is obvious that the competence base most critical for innovation in the economy as a whole is not scientific knowledge. Incremental innovation, 'absorptive capacity' and economic performance will typically reflect the skills and motivation of employees as well as inter- and intra-organisational relationships and characteristics. Science-based sectors may be rapidly growing but their shares of total employment and exports remain relatively small.

6 In the Anglo-Saxon countries the basic idea is that individuals should carry as much as possible of both benefits and costs. In the Nordic countries universal tax-financed welfare systems redistribute in favour of individuals that lose their jobs or become handicapped. The more conservative systems in place in Continental European countries tend to redistribute through employment-tied public insurance systems. In Southern Europe, where systems of social protection are relatively weak, the family can still play an important role as a redistributing mechanism. In Japan the big corporations redistribute resources to older workers who would otherwise be victims of change by offering them life-long employment.

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Growth and structural change in Africa: development strategies for the learning economy

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